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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,702	08/04/2000	HIDEYOSHI HORIMAI	106357	8307

25944 7590 01/20/2006

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/601,702	HORIMAI, HIDEYOSHI	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/9/05, 8/11/05, 6/15/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-8,16,17,51-56,58-60,79-85 and 96-112 is/are pending in the application.
- 4a) Of the above claim(s) 100-112 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,6,51-55,59,60,79-85 and 96 is/are allowed.
- 6) ☒ Claim(s) 7,8,16,17,56,58 and 97-99 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/9/05, 6/15/05 has been entered.

Response to Amendment

2. The amendments to the title of the disclosure in the submission dated 11/9/05 are acknowledged and accepted.
3. The amendments to Claims 1-2, 6-8, 16-17, 51, 53-54, 56, 59-60, 79, 81-85, 96 in the submission dated 11/9/05 are acknowledged and accepted.
4. The addition of Claims 100-112 in the submission dated 11/9/05 is acknowledged and accepted.

Election/Restrictions

5. Newly submitted Claims 100-112 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Art Unit: 2872

Newly submitted Claims 100-112 include limitations drawn toward a servo light source/means/generator that generates a servo light that emits onto the reflecting layer; and a detection means for detecting reflected servo light that is carrying information of the medium, reflected by the reflecting layer, such that an optical axis of the servo light and an optical axis of the reflected servo light are located in a same line. These limitations are not found readable on the elected invention, i.e. Invention IV, drawn to redundant multiplex recording of plural information on the same location (Redundant multiplex recording), which was made in the Office Action dated 2/28/03. Instead, the newly added claims appear to be readable on Invention I, drawn to optical recording/reproducing apparatus with position controlling means for controlling position of recording light relative to the rotating recording medium so light follows motion of the medium (Servo maintains same position on medium) (Again, see the Office Action dated 2/28/03).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, Claims 100-112 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

6. In view of the amendments made to the claims above, the rejections of Claims 1, 6-7, 51, 53-56, 59-60, and 96 under obviousness-type double patenting in Section 10 of the Office Action dated 12/15/04 are respectfully withdrawn.
7. In view of the amendments made to the claims above, the rejections of Claims 1, 6-7, 51, 53-55, 59-60, and 96 under obviousness-type double patenting in Section 11 of the Office Action dated 12/15/04 are respectfully withdrawn.
8. The Applicant argues that, with respect to Claims 97-98, since copending Application No. 10/357708 has not issued or been allowed as of the filing of the submission dated 11/9/05, filing a Terminal disclaimer is premature, and Applicant requests withdrawal of the rejection. The Examiner respectfully disagrees. As per MPEP 804 I B, a “provisional” non-statutory obviousness-type double patenting rejection should continue to be made as long as there are conflicting claims in more than one application unless that “provisional” double patenting rejection is the only remaining rejection. In the instant case, Claims 97-98 are also still rejected under 35 U.S.C. 103(a) (See *infra*).
9. The Applicant similarly argues that, with respect to Claims 56, 97-98, since copending Application No. 10/332057 has not issued or been allowed as of the filing of the submission dated 11/9/05, filing a Terminal disclaimer is premature, and Applicant requests withdrawal of the rejection. The Examiner respectfully disagrees. As per MPEP 804 I B, a “provisional” non-statutory obviousness-type double patenting rejection should continue to be made as long as there are conflicting claims in more than one application unless that “provisional” double patenting rejection is the only remaining rejection. In

Art Unit: 2872

the instant case, Claims 56, 97-98 are also still rejected under 35 U.S.C. 103(a) (See *infra*).

10. The Applicant argues that, with respect to newly amended Claims 1, 6, 51, 54, 59, the combined teaching of Curtis et al., Rembault, and Gabor fail to teach or reasonably suggest a recording optical system for illuminating the information recording layer on the same side thereof with the information light and the reference light for recording such that the information is recorded in the form of an interference pattern as a result of using the reflecting layer as a reference plane to generate interference between the information light and the reference light for recording. After reviewing the Curtis et al., Rembault, and Gabor references, the Examiner agrees, and respectfully withdraws the rejections of Claims 1-2, 6, 51-55, 59-60, 96 in Sections 13, 15 of the Office Action dated 12/15/04.
11. The Applicant similarly argues that, with respect to newly amended Claim 79, the combined teaching of Curtis et al., Rembault, Gabor, Burchardt, and Liu et al. fail to teach or reasonably suggest a recording optical system for illuminating the information recording layer on the same side thereof with the information light and the reference light for recording such that the information is recorded in the form of an interference pattern as a result of using the reflecting layer as a reference plane to generate interference between the information light and the reference light for recording. After reviewing the Curtis et al., Rembault, Gabor, Burchardt, and Liu et al. references, the Examiner agrees, and respectfully withdraws the rejections of Claims 79-85 in Sections 14, 16 of the Office Action dated 12/15/04.

12. The Applicants argue that, with respect to newly amended Claims 7 and 16, the combined teachings of Curtis et al., Rembault, and Gabor fail to teach or reasonably suggest the reproduction optical system projecting the reference light for reproduction onto the reflecting layer. The Examiner respectfully disagrees. In particular, Rembault specifically teaches a holographic read-out system (See Figure 5), wherein the reproduction optical system (See for example 710, 210, 711 in Figure 5) projects the reference light for reproduction (See 100 in Figure 5) onto the reflecting layer of the holographic recording medium (See 3 in Figure 5; See also Figures 8-12).
13. The Applicant traverses the rejections of Claim 56, but did not provide any arguments or remarks to show why these rejections were not proper.
14. The Applicant argues that, with respect to Claims 97 and 98, the combined teachings of Curtis et al., Rembault, and Gabor fail to teach or reasonably suggest an optical information recording apparatus including at least a servo light source that generates servo light that emits onto the reflecting layer, and a detection means for detecting reflected servo light that is carrying information of the medium, reflected by the reflecting layer, such that an optical axis of the servo light and an optical axis of the reflected servo light are located on a same line. The Examiner respectfully disagrees. In particular, it is noted that the features upon which applicant relies (i.e., a servo light source that generates servo light that emits onto the reflecting layer, and a detection means for detecting reflected servo light that is carrying information of the medium, reflected by the reflecting layer, such that an optical axis of the servo light and an optical axis of the reflected servo light are located on a same line) are not recited in the rejected

Art Unit: 2872

claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

15. Claims 7-8, 16-17, 56, 58, 97-99 are now rejected as follows.

Double Patenting

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. Claims 97-98 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-18 of copending Application No. 10/357708 (U.S. Patent Application Publication US2003/0147328 A1), of record. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons as set forth below.

Copending Application No. 10/357708 discloses an optical information recording apparatus (See for example Claims 1-3) for recording information holographically in an optical information recording medium having a reflective layer and an information recording layer, the apparatus comprising an information light source (See Claim 1) that generates information light carrying information; a recording reference light source (See Claim 1) that generates recording reference light, including a modulator (See Claims 2-3) that spatially modulates the recording reference light; and a recording optical system (See Claim 1) which projects the information light and the recording reference light such that an optical axis of the information light and an optical axis of the recording reference light are located on the same line.

Copending Application No. 10/357708 additionally discloses an optical information reproducing apparatus (See for example Claims 7-9) for reproducing information recorded holographically in an optical information recording medium having a reflective layer and an information recording layer, the apparatus comprising a reproduction reference light source (See Claim 7) that generates reproduction reference light, including a modulator (See Claims 8-9) that spatially modulates the reproduction reference light; a reproducing optical system (See Claim 7) that projects the reproduction reference light and collects reproduction light such that an optical axis of the reproduction reference light and an optical axis of the reproduction light are located on the same line.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Art Unit: 2872

18. Claim 56 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-30 of copending Application No. 10/332057 (U.S. Patent Application Publication US2004/0100892 A1), of record, in view of U.S. Patent No. 5917798, of record.

Copending Application No. 10/332057 discloses an optical information reproduction apparatus (See for example Claims 14-16, 18-25, 27-30) for reproducing information utilizing holographic from an optical information recording medium having information recording layer in which the information is recorded in the form of interference pattern between information light carrying information and reference light, the apparatus comprising a reference light generator (See for example Claims 14, 18, 20, 27) that spatially modulates the light to generate reference light on the same manner in which the reference light was modulated during recording; and a reproducing optical system (See for example Claims 14-15, 18-19, 21-22, 27-28) that illuminates, to a same side of the information recording layer that illuminated with the information light and reference light during recording, the information recording layer with the reference light, and collects reproduction light emanating from the information recording layers; wherein the reproduction optical system projects the reference light and collects the reproduction light such that an optical axis of the reference light and an optical axis of the reproduction light are located on a same line. Copending Application No. 10/332057 does not specifically disclose the information recording medium having a reflecting film and the information being two-dimensional digital pattern information. However, the use of reflecting layers in holographic recording systems are known in the art of holography. For example, U.S.

Patent No. 5917798 specifically discloses and claims a holographic recording and reproduction system similar to that of the instant application (See for example Figures 2, 7, 10, 14; Claims 1-19), wherein the information recording medium includes a reflective layer (See for example 5 in Figure 2). In addition, U.S. Patent No. 5917798 also discloses that two-dimensional digital patterns may be utilized as information to be recorded in the recording medium, as is extremely well known in the art (See for example Figure 1; col. 1, line 63-col. 2, line 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the information recording medium include a reflective layer and the information be two-dimensional digital pattern information, as taught by U.S. Patent No. 5917798, in the optical information recording and reproducing apparatus of Copending Application No. 10/332057 for the purpose of 1) providing additional beam position control since such reflective layers may include pits and grooves for servo and tracking applications, while allowing for routing of the object and reference beam to the recording information layer during recording and routing of the reproduced light from the recording information layer during playback, and 2) increase or maximize the storage capacity/density of the recording medium.

This is a provisional obviousness-type double patenting rejection.

19. Claim 97-98 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-30 of copending Application No. 10/332057 (U.S. Patent Application Publication US2004/0100892 A1), of record, in view of U.S. Patent No. 5917798, of record.

Copending Application No. 10/332057 discloses an optical information recording apparatus (See for example Claims 1-2, 5-6) for recording information holographically in an optical information recording medium having an information recording layer, the apparatus comprising an information light source (See Claim 1) that generates information light carrying information; a recording reference light source (See Claim 1) that generates recording reference light, including a modulator (See Claims 5-6) that spatially modulates the recording reference light; and a recording optical system (See Claims 1-2) which projects the information light and the recording reference light such that an optical axis of the information light and an optical axis of the recording reference light are located on the same line.

Copending Application No. 10/332057 additionally discloses an optical information reproducing apparatus (See for example Claims 14-16) for reproducing information recorded holographically in an optical information recording medium having an information recording layer, the apparatus comprising a reproduction reference light source (See Claim 14) that generates reproduction reference light, including a modulator (See Claim 16) that spatially modulates the reproduction reference light; a reproducing optical system (See Claims 14-15) that projects the reproduction reference light and collects reproduction light such that an optical axis of the reproduction reference light and an optical axis of the reproduction light are located on the same line.

Copending Application No. 10/332057 does not specifically disclose the information recording medium having a reflecting film. However, the use of reflecting layers in holographic recording systems are known in the art of holography. For example, U.S.

Art Unit: 2872

Patent No. 5917798 specifically discloses and claims a holographic recording and reproduction system similar to that of the instant application (See for example Figures 2, 7, 10, 14; Claims 1-19), wherein the information recording medium includes a reflective layer (See for example 5 in Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the information recording medium include a reflective layer, as taught by U.S. Patent No. 5917798, in the optical information recording and reproducing apparatus of Copending Application No. 10/332057, for the purpose of providing additional beam position control since such reflective layers may include pits and grooves for servo and tracking applications, while allowing for routing of the object and reference beam to the recording information layer during recording and routing of the reproduced light from the recording information layer during playback.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2872

21. Claims 7, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al. (U.S. Patent No. 5719691), of record, in view of Rembault (U.S. Patent No. 4025731) and Gabor (U.S. Patent No. 3899240), of record.

Curtis et al. discloses an optical information reproducing apparatus (See Figure 1) for reproducing two-dimensional digital pattern information utilizing holography from an optical recording medium (See 13, 15 in Figure 1; col. 4, lines 20-37) having an information recording layer in which information recorded utilizing holography (See Figure 1) in the form of an interference pattern as a result of interference between information light (See 26 in Figure 1) carrying the two-dimensional digital pattern information and reference light (See 11 in Figure 1) for recording having a spatial modulation (See col. 4, lines 20-37; note the spatially modulated phase formed by the phase mask), the apparatus comprising reproduction reference light generation means including modulation means for spatially modulating the light for generating reference light for reproduction, the modulation means spatially modulating the reference light for reproduction in the same manner in which the reference light for recording was modulated when the information was recorded (See 11, 25 in Figure 1; col. 4, lines 20-37; Abstract; col. 1, line 60-67; col. 10, lines 61-67); a reproducing optical system (See 16, 17, 18, 24, 12 in Figure 1) for illuminating the information recording layer with the reference light for reproduction on a same side of the information recording layer that is illuminated with the information light and the reference light for recording and for collecting reproduction light carrying the two dimensional digital pattern information (It is noted that 16, 17, 18, 24, 12 in Figure 1 of Curtis et al. are located on one side of

holographic medium 13); and detection means for detecting the reproduction light carrying the two dimensional digital pattern information collected by the reproducing optical system (See 22 in Figure 1). Curtis et al. lacks the information recording medium having a reflecting film; collecting the reproduction light on the same side of the information recording layer that is illuminated with the reference light for reproduction; and the reproduction optical system projecting the reference light for reproduction onto the reflecting layer and collecting the reproduction light such that the optical axis of the reference light for reproduction and an optical axis of the reproduction light are on the same line. However, it is well known in the art of holography to utilize or provide reflecting films on the holographic information recording media used to record holographic information. For example, Rembault teaches a holographic information recording medium (See for example Figures 2-3, 10-12) for recording and playback in a holographic optical pickup device (See Figures 3, 5), wherein the recording medium (See 3 in Figure 3; Figures 10-12) further includes a reflecting film (See 32 in Figures 10-12) disposed adjacent to the holographic recording film (See 320, 321 in Figures 10-12). In utilizing a reflective layer in the information recording medium, the optical pickup device projects the reference light for reproduction onto both the information recording medium and the reflecting layer, and the reproduced light is reflected and sent to a detection system (See Figure 5; col. 9, lines 51-col. 11, line 18). In addition, by using a reflective layer in the information recording medium, Rembault teaches that one may collect the reproduction light on the same side of the information recording layer that is illuminated with the reference light for reproduction (See Figure 5; col. 9, line 51-col. 11, line 34).

The combined teachings of Curtis et al. and Rembault lack the optical axis of the reference light for reproduction and an optical axis of the reproduction light being on the same line. However, such particular optical configurations for recording and reproduction of holograms from a holographic information recording medium are known in the art. For example, Gabor teaches a method and apparatus for generating discriminating holograms (See for example Figure 1), wherein the optical axes of the object and recording reference beams, as well as the optical axes of the reproduction reference beam and the reproduction beam, may be located on the same line (See beams traversing element 30 and 33 in Figure 1). In utilizing such an optical configuration for recording, only one object lens for projecting the information light and reference light for recording onto the recording medium is required (See 30 in Figure 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the information recording medium have a reflecting film; collect the reproduction light on the same side of the information recording layer that is illuminated with the reference light for reproduction; and the reproduction optical system project the reference light for reproduction onto the reflecting layer and collecting the reproduction light such that the optical axis of the reference light for reproduction and an optical axis of the reproduction light are on the same line, as taught by both Rembault and Gabor, in the optical information recording and reproducing apparatus and method of Curtis et al., for the purpose of 1) utilizing both sides of the information recording medium to for storage, thus increasing storage capacity; and 2) confining the optical system for

Art Unit: 2872

recording and reproducing the hologram from the information recording medium to a smaller space or footprint.

22. Claims 97-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al., in view of Rembault and Gabor.

Curtis et al. discloses an optical information recording apparatus (See for example Figures 1, 3) for recording information holographically in an optical information recording medium having an information recording layer (See 13 in Figure 1), the apparatus comprising an information light source that generates information light carrying information (See 26, 15 in Figure 1); a recording reference light source that generates recording reference light, including a modulator that spatially modulates the recording reference light (See 11, 25 in Figure 1; col. 4, lines 20-37); and a recording optical system which projects the information light and the recording reference light (See 16, 17, 18, 24, 12 in Figure 1). Curtis et al. additionally discloses an optical information reproducing apparatus (See for example Figures 1, 3) for reproducing information recorded holographically in an optical information recording medium having an information recording layer, the apparatus comprising a reproduction reference light source that generates reproduction reference light, including a modulator that spatially modulates the reproduction reference light (See 11, 25 in Figure 1; col. 4, lines 20-37; Abstract; col. 1, line 60-67; col. 10, lines 61-67); a reproducing optical system that projects the reproduction reference light and collects reproduction light (See 12, 24, 19, 20, 21 in Figure 1). Curtis et al. lacks the information recording medium having a reflecting film; the optical axis of the recording reference light and an optical axis of the

information light being on the same line; and the optical axis of the reproduction reference light and an optical axis of the reproduction light being on the same line.

However, it is well known in the art of holography to utilize or provide reflecting films on the holographic information recording media used to record holographic information. For example, Rembault teaches a holographic information recording medium (See for example Figures 2-3, 10-12) for recording and playback in a holographic optical pickup device (See Figures 3, 5), wherein the recording medium (See 3 in Figure 3; Figures 10-12) further includes a reflecting film (See 32 in Figures 10-12) disposed adjacent to the holographic recording film (See 320, 321 in Figures 10-12). In addition, by using a reflective layer in the information recording medium, Rembault teaches that one may collect the reproduction light on the same side of the information recording layer that is illuminated with the reference light for reproduction (See Figure 5; col. 9, line 51-col. 11, line 34). The combined teachings of Curtis et al. and Rembault lack the optical axis of the recording reference light and an optical axis of the information light being on the same line and the optical axis of the reproduction reference light and an optical axis of the reproduction light being on the same line. However, such particular optical configurations for recording and reproducing holograms from a holographic information recording medium are known in the art. For example, Gabor teaches a method and apparatus for generating discriminating holograms (See for example Figure 1), wherein the optical axes of the object and recording reference beams, as well as the optical axes of the reproduction reference beam and the reproduction beam, may be located on the same line (See beams traversing element 30 and 33 in Figure 1). Therefore, it would have been

obvious to one having ordinary skill in the art at the time the invention was made to have the information recording medium have a reflecting film; the optical axis of the recording reference light and an optical axis of the information light be on the same line; and the optical axis of the reproduction reference light and an optical axis of the reproduction light be on the same line, as taught by both Rembault and Gabor, in the optical information recording and reproducing apparatus of Curtis et al., for the purpose of 1) utilizing both sides of the information recording medium for storage, thus increasing storage capacity; and 2) confining the optical system for recording and reproducing the hologram from the information recording medium to a smaller space or footprint.

23. Claims 16, 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al. in view of Rembault and Gabor as applied to Claims 7, 56, 97-98 above, and further in view of Liu et al. (U.S. Patent No. 6272095), of record.

Curtis et al. in view of Rembault and Gabor discloses the invention as set forth above. Curtis et al. in view of Rembault and Gabor lacks a wavelength selection means for selecting a wavelength of light illuminating the information recording layer from among a plurality of wavelengths. Liu et al. teaches an apparatus and method for storing and/or reading data on an optical disk by holographic means (See Figures 1-2, 4-6, 8-10, 13, 18; col. 3, line 7-col. 6, line 27; col. 18, line 42-col. 19, line 51). In particular, Liu et al. teaches the reproduction reference light generation means (See 104, 106 in Figure 4 for example); a reproducing optical system for illuminating the information recording layer with the reference light and for collecting reproduction light generated at the information recording layer (See 110, 120 in Figure 4 for example); and detection means for detecting

the reproduction light collected by the reproducing optical system (See 132, 130, 124 in Figure 4 for example). Liu et al. additionally teaches wavelength selection means for selecting a wavelength of light illuminating the information recording layer from among a plurality of wavelengths (See col. 18, line 20-col. 20, line 52) and the apparatus performing wavelength and spatial multiplexing (See for example Figure 3; col. 20, lines 13-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the apparatus and method for storing and/or reading data on an optical disk by holographic means of Curtis et al. in view of Rembault and Gabor to further include a wavelength selection means for selecting a wavelength of light illuminating the information recording layer from among a plurality of wavelengths, as taught by Liu et al. One would have been motivated to include wavelength selection means and spatial/wavelength multiplexing to increase the storage density of the recording medium, as well as reducing cross-talk noise.

24. Claims 8, 17, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al. in view of Rembault and Gabor, and further in view of Liu et al. as applied to Claims 7, 16, 56, 97-98 above, and further in view of van Rosmalen (U.S. Patent No. 4638471), of record, Reid et al. (U.S. Patent No. 4213193), of record, or Hays et al. (U.S. Patent No. 5777760), of record.

Curtis et al. in view of Rembault and Gabor, and further in view of Liu et al. discloses the invention as set forth above in Claims 7, 16, 56, 97-98 above, except for the optical information recording medium having a positioning region, and the apparatus further comprising position control means. However, van Rosmalen, Reid et al., and Hays et al.

all discloses various optical recording and reproducing apparatus that utilize a recording medium having a positioning region, and the apparatus further comprising a position control means. van Rosmalen teaches a conventional recording and reproducing apparatus (See Figure 1) wherein the record carrier includes locations having signal information, as well as positional information of the scanning spot relative to the information track (See col. 5, lines 1-20). Reid et al. similarly discloses a conventional recording and reproducing apparatus, particularly suited for holography (See Figure 1) wherein particular locations on the storage medium include block bits for providing information on identification and location of any particular data page in one of the plural hologram data tracks (See Figure 8; col. 6, lines 14-49). This data is used in conjunction with a controller means (See 46 in Figure 1; col. 5, line 38-col. 6, line 13). Hays et al. teaches a position feedback system for a volume holographic storage medium (See Figure 10) wherein a plurality of servo blocks are recorded on the storage medium to provide position information to position control means, such as a voice coil motor (See Figure 2; abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the optical information recording medium of Curtis et al. in view of Rembault and Gabor, and further in view of Liu et al., to further have a positioning region, and the apparatus further comprising position control means, as taught by van Rosmalen, Reid et al., and Hays et al., for the purpose of improving storage capacity and reducing cross-talk noise.

Allowable Subject Matter

25. Claims 1-2, 6, 51-55, 59-60, 79-85, 96 are allowed.
26. The following is a statement of reasons for the indication of allowable subject matter:
- Claims 1, 6, 51, 54, 59, and 79 are allowable over the cited art of record for at least the reason that the cited art of record fails to teach or reasonably suggest an optical information recording and reproducing apparatus and method, as generally set forth in Claims 1, 6, 51, 54, 59, and 79, the apparatus and method including, in combination with the features recited in Claims 1, 6, 51, 54, 59, and 79, illuminating the information recording layer on a same side thereof with the information light and the reference light for recording such that the information is recorded in the form of an interference pattern as a result of using the reflecting layer as a reference plane to generate interference between the information light and the reference light for recording. Claims 2, 52-53, 55, 60, 80-85, 96 are dependent on Claims 1, 6, 51, 54, 59, and 79, and hence are allowable for at least the same reasons Claims 1, 6, 51, 54, 59, and 79 are allowable.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2872

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A handwritten signature in cursive script, reading "Arnel C. Lavarias".

Arnel C. Lavarias
Patent Examiner
Group Art Unit 2872
1/18/06